DOCUMENT RESUME

ED 222 045 FL 013 211

AUTHOR Akiyama, M. Michael; And Others
TITLE Language Universal and Language Specific Aspects in the Acquisition of the Verification System.
INSTITUTION Stanford Univ., Calif. Dept. of Linguistics.
PUB DATE 82
NOTE 9p.; In its: Papers and Reports on Child Language Development, Number 21, p1-8.

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Child Language; Contrastive Linguistics; *English; *Japanese; *Language Acquisition; *Language Universals; *Negative Forms (Language); Young Children

ABSTRACT

Three experiments were conducted to conceptualize how structural differences between English and Japanese affect the way in which young children acquire the verification system. Linguistic characteristics that may distinguish between English and Japanese verifications are described along with the possible responses to four types of statement: true affirmative, false affirmative, true negative, and false negative. The experiments involved English speaking and Japanese speaking children between the ages of 3 and 7. Three models for the verification of English and Japanese statements were tested. The models specify language universal and language specific aspects of verification system acquisition. The universal aspect across the three models is the way in which affirmative statements are verified. The language specific aspects center on how different models incorporate negation in each of the two languages. The models appear to account for most verification processes in the two languages under different conditions. (RW)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

Papers and Reports on Child Language Development, No. 21 (1982)

Stanford Univ. Dept. of Linguistics

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY Stanford Univ.

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

ED222045

Language Universal and Language Specific Aspects in the Acquisition of the Verification System

M. Michael Akiyama
UNIVERSITY OF OKLAHOMA

Kozue Saito
KOKUGAKUIN UNIVERSITY

Sumie Takei
UNIVERSITY OF TOKYO

Cross linguistic research on language acquisition has focused on the question of whether children all over the world learn their languages in a similar fashion. At the very general level, the answer to this question is simple and affirmative. If you look at the milestones in language acquisition (e.g. cooing, babbling, first word/one word stage) or the semantic relations expressed by young children speaking different languages, you will find remarkable similarities across languages, supporting the universality hypothesis (Slobin, 1970, 1973). At a more specific level, however, the answer to this question tends to be more complicated. Recently researchers have attempted to conceptualize how different types of languages call for different processes of language acquisition (Slobin, 1978; MacWhinney and Bates, 1978). In this paper, we would like to conceptualize how structural differences between English and Japanese affect the way in which young children acquire the verification system.

Before I go into how people generally verify statements, I need to introduce two important linguistic characteristics that might distinguish the English verification and the Japanese verification. One is the word order. English is considered to be a S(subject), V(verb), O(object) language, whereas Japanese is considered to be a S-O-V language (Greenberg, 1963; Kuno, 1973). An important consequence of this structural difference is that a negation appears in the middle in English (e.g. You are not a child) and at the end in Japanese (e.g. You child are not). If children attend to the end of a temporal unit (Slobin, 1979), a Japanese negation will be more salient than the English counterpart. These aspects may affect the verification processes across the two languages.

The second characteristic is the relationship of the verification to the yes-no question answering system. The English answering system does not operate like the verification system especially when answering negative questions, whereas the Japanese system operates like the verification system. Suppose, for example, we ask a child, "Are you a baby?" or "Aren't you a baby?". An English-

[1]A portion of research was supported by NIMH grant 1 R03 MH 34606-1 to the first author. The authors wish to thank Frank Durso, Belinda Biscoe, and Susan Ervin-Tripp for their helpful comments on earlier version of this paper.

FL013211

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
X This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

speaking child would respond, "No, I am not a baby" regardless of the form of statements. Yes or no does not depend on whether there is a negation in the question. Therefore, the English-speaking child can ignore the negation and still can respond correctly to negative questions. In contrast, a Japanese-speaking child has to process a negation to respond correctly to questions. The child would respond to the negative question Aren't you a baby?, "Yes (what you have said is correct), I am not a baby." If the answering system is more dominant than the verification system in child language, then the way in which a question is answered is likely to affect the English verification process but not the Japanese verification process.

Keeping these two linguistic characteristics in mind, we would like to describe how statements are verified. There are four types of statements of interest. They are true affirmatives (e.g. You are a child), false affirmatives (e.g. You are a baby), true negatives (e.g. You aren't a baby) and false negatives (e.g. You aren't a child). Current verification models (e.g. Carpenter and Just, 1975; Clark and Chase, 1972) have specified the relative difficulty of these four statements. The order of difficulty is true affirmatives, false affirmatives, false negatives, and true negatives. Since previous verification experiments (Akiyama, 1979 a,b) on children have failed to distinguish the relative difficulty of true affirmatives and false affirmatives, we will focus on the two types of negative statements. According to our application of the current verification model to the present study, children learn to verify negative statements in the following manner, as shown in Table 1. First, on hearing a statement they represent the statement in terms of a polarity marker and a content string. For the statement, You are not a child, the polarity marker is a NEG and the content string is (I, CHILD). Second, they represent their affirmative knowledge about the topic. For this particular statement the representation is AFF(I, CHILD). Third, they compare the statement representation and knowledge representation. Next, they start comparing the content strings first, and then the polarity markers. Whenever they find a mismatch, the truth index initally set as right changes into the opposite truth index. Finally, they respond right if the two representations match semantically, and wrong if they do not.

TABLE 1
Statement & Knowledge Representations Specified by the English Statement Verification Model

	TYPES OF STATEMENTS			
STAGES	True Affirmative	False Affirmative	False Negative	True Negative
Statement	AFF(I,CHILD)	AFF(I,BABY)	NEG(I,CHILD)	NEG(I,BABY)
Knowledge	AFF(I,CHILD)	AFF(I,CHILD)	AFF(I,CHILD)	AFF(I,CHILD)
		-	- +	- +
Comparison	+ +	+ +	+ +	+ +
Response	right	wrong	wrong	right

The third stage is most crucial in predicting the acquisition order of verifying the four types of statements. Among the two types of negative statements of our focus, false negatives have only one mismatch between the polarity markers (NEG-AFF) whereas true negatives have two mismatches, one between the polarity markers (NEG-AFF) and the other between the contents [(I,BABY)-(I,CHILD)]. Therefore, processing false negatives should be less complex than processing true negatives. In developmental terms, verifying false negatives should be acquired earlier than true negatives. If language acquisition processes are universal, children speaking different languages should acquire verifying different types of statements in this order. The universality hypothesis may not be tested properly by using languages structurally similar to the English language for an obvious reason. The similarity in acquisition order as a probable finding can be accounted for by the similarity in the language structure. In this respect, the use of the Japanese language seems to be appropriate to test this hypothesis.

Experiment I

In Experiment I, we asked English-speaking children of ages 4, 5, 6, and 7 to say right or wrong to the four types of statements and yes or no to the corresponding types of questions. In each of three age groups, sixteen children were involved. There were equal numbers of boys and girls. There were twelve statements in each of the four types. Children's responses were scored in the following manner. Expected responses such as right (sou) to true statements or wrong (chigau) to false statement were scored correct. Also, responses semantically consistent with the expected responses were scored correct. For example, the response no to the statment You are not a child was taken to mean wrong, and scored correct. There were a few subjects in younger age groups who persistently responded yes or no to statements. Most of the subjects, however, followed the instruction and said right or wrong.

The results for the verification portion are shown in Table 2. The numbers in Table 2 indicate error percentages for the four types of statements. If you look at the right half of the table, you will see a drastic developmental change within three years of age. The only results that are consistent with the verification model are those of the oldest age group. The verification model simply cannot account for the high percentages of errors by more than 70%. It seems that children of different age groups verify statements in quite different ways, even though all of them are speaking the same English language.

TABLE 2
Percentage of errors for the Four Types of Statements Among English-Speaking Children
EXPERIMENT I

Age	TYPES OF STATEMENTS			
	True Affirmative	False Affirmative	False Negative	True Negative
4	6	10	72	74
5	2	4	54	56
6-7	1	4	10	28

In order to account for the high error rate among young children, we need to develop an acquisition model. Our model states that young children interpret negative statements as if they were corresponding negative questions. Since negations in negative questions can be ignored to answer correctly, negations do not appear in the statement representation as shown in Table 3. Children then compare the statement representation with the knowledge representation, find a match for false negatives and a mismatch for true negatives, implicitly produce a yes or no answer, and finally convert yes to right and no to wrong. However, these responses right or wrong are incorrect responses. Our acquisition model now explains why children find negative statements extremely difficult. We propose that the difficulty of representing negations is due to the middle position of a negation in the English sentence and a unique relationship between the answering system and the verification system.

TABLE 3
Statement & Knowledge Representation Leading to Incorrect Responses to Negative Statements

Steps	TYPE OF STATEMENTS	
	False Negative	True Negative
Statement	(I,CHILD)	(I,BABY)
Knowledge	(I,CHILD)	(I,$\overline{\text{CHILD}}$)
Comparison	+	+
Initial Response	yes	no
Final Response	right (incorrect)	wrong (incorrect)

As you may recall, the Japanese language is a S-O-V language and therefore a negation always appears at the end of a sentence. In addition, the answering system and the verification system are almost identical. In other words, a negation is in a more salient position, and is unlikely to be ignored. These linguistic characteristics should help Japanese-speaking children acquire the verification of negative statements earlier than their English-speaking counterparts. It is also of interest to test the universality hypothesis, i.e., to see whether true negatives are more difficult to acquire than false negatives.

Experiment II

In Experiment II, I asked 18 English-speaking children and 18 Japanese-speaking children to verify 14 statements among each of the four types. Children's ages were 3 and 4; and their sexes were roughly balanced.

The results are shown in Table 4. As you can see from the table, the English-speaking children show the predicted order of acquisition with true negatives being more difficult than false negatives. In contrast, the Japanese-speaking children find false negatives more difficult than true negatives. For affirmatives, there are no discernible differences across the two language groups.

TABLE 4
Percentage of Errors for the Four Types of Statements
Among English-Speaking Children and Japanese-Speaking Children
EXPERIMENT II

		Types of Statements			
Language Group	Age	True Affirmatives	False Affirmatives	False Negatives	True Negatives
English	3	8	12	41	52
	4	3	8	21	54
Japanese	3	6	9	44	10
	4	4	3	27	14

These results suggest language specific aspects as well as language universal aspects in the acquisition of the verification system. There are two language specific aspects. First, English-speaking children acquire the verification of negative statements later than Japanese-speaking children. Second, more importantly, English-speaking children show later acquisition of true negatives than false negatives, but Japanese-speaking children show the opposite direction of acquisition order. The only language universal apsect is that both English-speaking children and Japanese-speaking children acquire verifying affirmative statements about the same time. Since negation is not included in affirmative statements, and both of the verification systems and the answering systems operate in the same manner for affirmatives, it is reasonable to find universal aspects in the verification of affirmative statements.

To complete our conceptualization, we propose a verification model for Japanese-speaking children. The basic assumptions are unchanged, as you can see in Table 5. That is, children represent statement and knowledge in terms of a polarity marker and content string, and compare the representations. What is unique to this model is that children develop a negative representation for a false affirmative statement and for a true negative statement, and then compare the representations starting from the polarity marker to the content string. The processing of the polarity marker at the very beginning reflects the SOV word order of the Japanese statement, more specifically, the

end position of a negative. Let us focus on the relative difficulty of false negatives and the true negatives. The false negative statement You are not a child is represented as (I, CHILD)NEG and is compared with the knowledge representation (I, CHILD)AFF. There is one mismatch at the polarity marker. On the other hand, the true negative statement You are not a baby is represented as (I, BABY)NEG and is compared with the negative knowledge (I, BABY) NEG. Since knowledge is represented in a way that matches the statement representation, there is no mismatch involved. Therefore, true negatives are less difficult to verify than false negatives for Japanese-speaking children. In summary of Experiment II, we have shown language specific as well as language universal aspects when children were instructed to say right or wrong to a statement.

TABLE 5
Statement and Knowledge Representations
Specified by the Japanese Verification Model

Steps	Type of Statements			
	True Affirmatives	False Affirmatives	False Negatives	True Negatives
Statements	(I,CHILD)AFF	(I,BABY)AFF	(I,CHILD)NEG	(I,BABY)NEG
Derived Knowledge	(I,CHILD)AFF	(I,BABY)NEG	(I,CHILD)AFF	(I,BABY)NEG
Comparison	+ +	+ +	+ +	+ +
Response	Sou	Chigau	Chigau	Sou

Experiment III

For the last experiment, I would like to show some findings of Japanese-speaking children under a linguistically relaxed condition. As you may recall, we argued that English-speaking children find negative statements very difficult to verify because they are not accustomed to processing the negation. In Experiment III, we provided Japanese-speaking children with the condition of not requiring them to process the negation. For example, the experimenter stated statements such as You aren't a baby, and allowed children to respond freely. We expected that Japanese-speaking children under this relaxed condition might process negative statements as English-speaking children do. The ages of the children were 3, 4, and 6. Under this relaxed condition, a variety of responses was observed. The most frequent responses to the true negative statement such as You are not a baby was Baby am not, and am not (ja-nai). This type of response can be considered parallel to the appropriate English answer to the corresponding question. In English, a child would answer No, I am not a baby to the question Aren't you a baby?. The only difference is that the Japanese response does not contain the first adverb in the English response. The scoring was unchanged. Any semantically positive response to true statements was scored correct and any semantically negative response to false statements was scored correct.

The results are shown in Table 6. As you can see in the table, the percentage of errors in true negatives is higher than the percentage of errors in false negatives. The overall pattern is similar to the pattern of the English-speaking chilren. The Japanese-speaking children under the relaxed condition seem to process statements as English-speaking children do.

TABLE 6
Percentage of Errors for the Four Types of Statements
Under the Linguistically Relaxed Conditions
EXPERIMENT III

Age	Type of Statement			
	True Affirmative	False Affirmative	False Negative	True Negative
3	10	29	20	78
4	5	21	11	64
6	0	3	0	16

In summary, we have presented three different models for the verification of English statements and Japanese statements. These models have specified language universal as well as language specific aspects in the acquisition of the verification system. The first one is the standard verification model that can account for the older English-speaking children's response pattern as well as the Japanese-speaking chilren's response pattern under the linguistically relaxed condition, but cannot account for the younger English-speaking children's response pattern nor the Japanese-speaking chilren's response pattern under the verification condition. The second model is the developmental model stating that the younger English-speaking children respond to statements as if these statements were questions. This second model can account for the developmental change that takes place in English-speaking children between ages 4 and 7. The third model is developed to account for the Japanese-speaking children's response pattern. The universal aspect across the three models is the way in which affirmative statements are verified. The language specific aspects of these three models center upon how different models incorporate negation in each of the two languages. The major aspect of the second model that accounts for the young English-speaking children's problem is the deletion of a negation. Two major aspects of the third model that account for the Japanese verification are the generation of the negative knowledge representation and the initial processing of a negation due to its end position in a statement. These three models seem to be able to account for most verification processes in the two languages under different conditions. Whether children show a universal pattern of language acquisition depends upon the specific aspects of the task, and the instruction given.

References

Akiyama, M. M.: Yes-No answering system in young children. Cognitive Psychology, 1979a, 11, 485-504.

Akiyama, M. M.: Language acquisition strategies may not be universal. A paper presented at the Biennial Meeting of the Society for Research in Child Development, 1979b, March 15-18.

Carpenter, P. & Just, M. A.: Sentence comprehension: A psycho-linguistic model of sentence verification. Psychological Review, 1975, 82, 45-73.

Clark H. H. & Chase, W. G.: On the process of comparing sentences against pictures. Cognitive Psychology, 1972, 3, 472-517.

Greenburg, J. H. (Ed.): Universals of language. Cambridge, MA: The MIT Press, 1963.

Kuno, S. The structure of the Japanese language. Cambridge, MA: The MIT Press, 1973.

MacWhinney, B. & Bates, E.: Sentential devices for conveying given-ness and newness: A cross-cultural developmental study. Journal of Verbal Learning and Verbal Behavior, 1978, 17, 539-558.

Slobin, D. I.: Universals of grammatical development in children. In G. B. Flores d'Arcais & W. J. M. Velelt (Eds.), Advances in psycholinguistics. Amsterdam: North-Holland, 1970.

Slobin, D. I.: Cognitive prerequisites for the development of grammar. C. A. Ferguson & D. I. Slobin (Eds.), Studies of child language development, New York: Holt, Rinehard and Winston, 1973.

Slobin, D. I.: Psycholinguistics. Glenview, Ill.: Scott, Foresman & Company, 1979.

Slobin, D. I. Universal and particular in the acquisition of language. Paper presented at workshop-conference on "Language Acquisition: State of the Art," University of Pennsylvania, May 19-22, 1978.